

Nagoya Trip Report

This note summarizes the results of the discussions at Nagoya on 17 - 23 November 1999. The short-term goal is to scan, locate, and perform the decay search on, at least 300 events (total) before 1 February 2000. A status report and more specific goals and tasks are outlined below.

1- Status

The status of the event location analysis is summarized graphically in Figure 1. The numbers represent totals from all past analysis phases, Pass 1 and 2, as well as the present phase, Pass 3. The flow of the events represents how the events have been selected for scanning by Okada from the initial set of 901 “Category 3” events that were found with stripping and eye-scanning of the spectrometer data. Presently, Nonaka counts 203 events as found in the emulsion. There are 105 more events that have been scanned, but location is temporarily “on-hold” while all the emulsion data is reconstructed using the latest version of the track-linking code (`ecfsal` ; version 23). Also, vertex predictions for 214 more events that were not scanned before, are being made and sent to Nagoya, finishing the Pass 3 input set. Finally, there are 79 events that were not located in the scan volume recorded in Pass 2. These must be re-scanned after making another attempt at vertex prediction for these events.

Assuming a 50% chance that events are appropriate for scanning, a 50% probability of locating scanned events, and a 20% chance of locating previously scanned events, we estimate that a total of 379 events can be located, assuming further that all low multiplicity events not previously located are deferred until after the beginning of February.

Two UTS scanning stations are devoted to DONUT analysis, and the net scanning rate, including inefficiencies, is observed to be about 30 events per week. Thus, locating 100+ more events by January 2000 is clearly possible.

2- Plan

To achieve a full analysis, including the decay search, on 300 events by February is not easy, and forces a tight schedule. In order to meet our goal, the following tasks will be done in Japan:

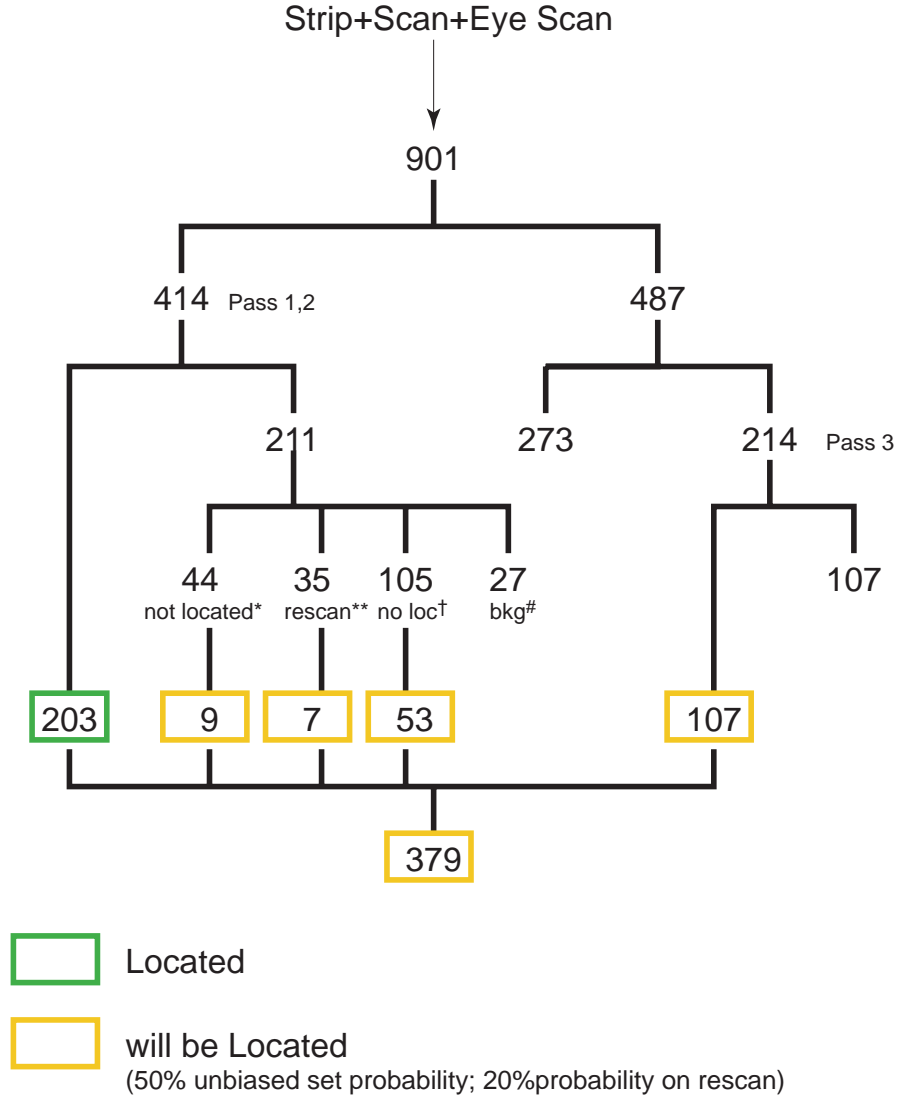
- ◆ Scan the remaining Pass 3 events and re-scan new volumes of not located events
- ◆ Run the new emulsion reconstruction code (`ecfsal v23`) on all scan data
- ◆ Attempt to located all newly scanned events
- ◆ Re-scan and make the “decay m-files” for located events
- ◆ Perform decay search for region I (S) and region II (LL) [see below]
- ◆ Make any necessary special scans for momentum analysis, or e -ID, ...

The tasks for collaborators in the US and Greece are:

- ◆ Finish vertex predictions for Pass 3 events
- ◆ Make new vertex predictions for “easy” events that were not previously located
- ◆ Develop methods for region I & III decay searches
- ◆ Perform region I and III decay search using decay m-files

- ◆ Continue to study the neutrino beam properties using μ CC and e CC events
- ◆ Find a set of events with momentum analyzed (1-5 GeV/c) tracks for scatter analysis

The decay search regions are defined in Figure 2. Region I is the short decays (S) that must be found with impact-parameter only. Region II is the relatively easy-to-find decays (LL ~ long decay length+large decay angle). And Region III are the small-angle decays (LS ~ long+small angle) that are not recognized (simply) in the .dcy files. Finally, Region IV denotes the short, small-angle decays that will be lost in this analysis. Roughly, the regions I, II and III are evenly populated, 30% each, and region IV comprises the remaining 10%.



- * Primary vertex location attempted but not found
- ** Primary vertex location attempted but not found; rescanned
- † Events scanned, but location not yet attempted
- # Events not scanned; high background region

Figure 1. Event location status as of 16 Nov 1999. The numbers in yellow boxes are estimates.

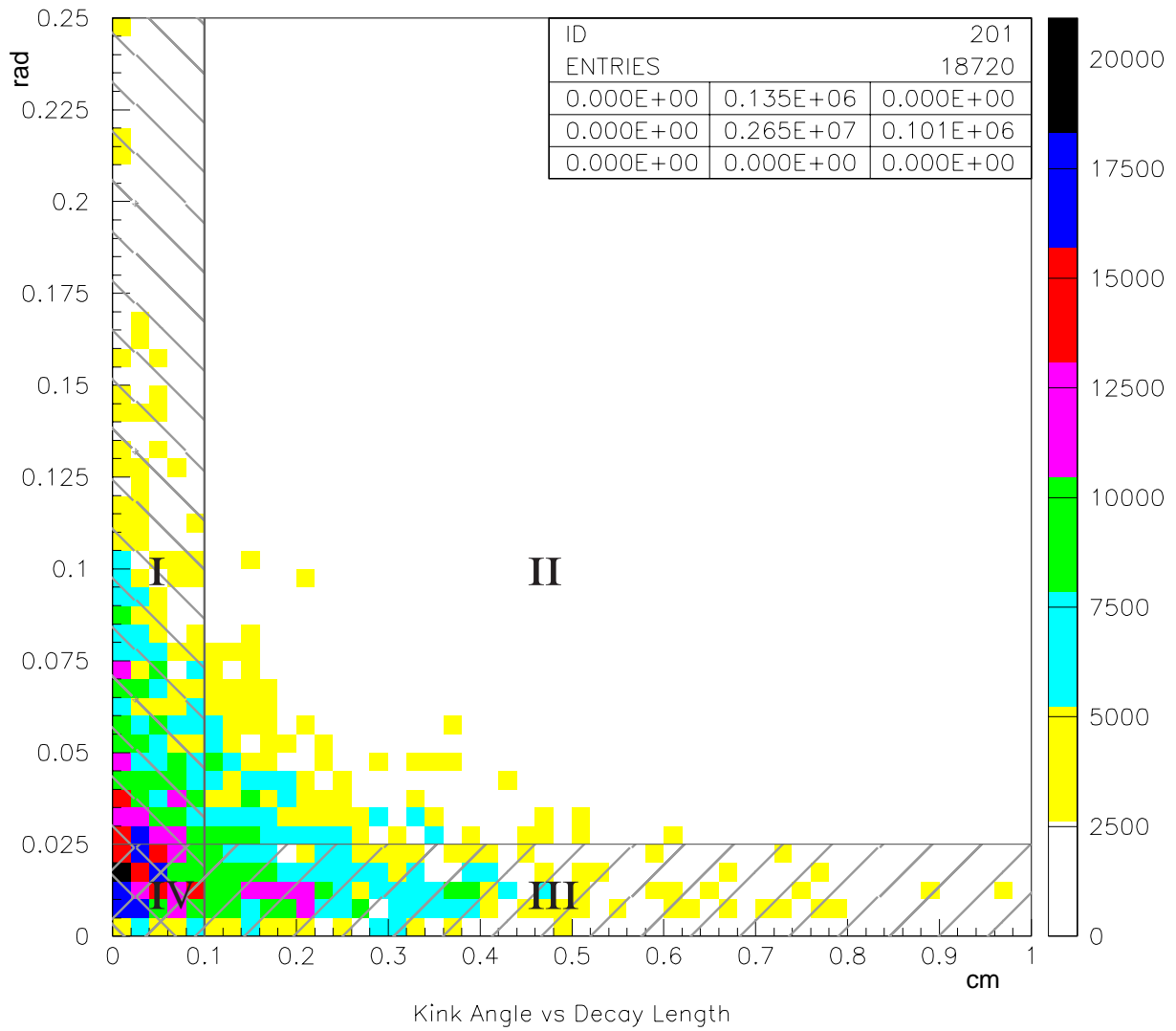


Figure 2. The daughter (kink) angle (y-axis) and flight length (x-axis) Monte Carlo distribution. The four regions that are mentioned in the text are shown. The populations of the Regions are (I) 32%, (II) 29%, (III) 28% and (IV) 11%.